

## REMARKS

Claims 1-12 were pending in the application, after the election thereof and withdrawal of non-elected claims 13-19. In the Office Action, all claims stand rejected under 35 USC §§ 112¶2 and 102(b). Claim 6 further stands objected to for an informality.

In this Amendment, claims 1-9 and 13-19 are canceled; claims 10-12 are amended; and new claims 20-34 are added. Claims 10-12 and 20-34 presently are pending in the application.

In addition, Applicant presents the following remarks regarding the claims, amendments thereto, and the rejections.

### **Rejection of Claim Under 35 USC § 102(b)**

Claims 10-12 stand rejected as anticipated by Modak, US 5772640. The rejection is respectfully traversed, although it is believed moot in view of the present claim amendments.

*Modak '640 Teaches A Synergistic Combination.* As a first matter, it is noted that Modak '640 emphasizes a synergy between chlorhexidine and triclosan, and that this combination of antimicrobial agents is required to be used in the "hose" of Modak '640. Removal of one-half of the synergistic combination of Modak '640 would impermissibly change the principle of operation of the invention therein. (See *In re Ratti*, 123 USPQ 349 (CCPA 1959); *accord* MPEP 2143.01.)

Claim 10 has been amended to include structural limitation language that limits the hose to a garden hose and to recite "one antimicrobial agent".

*"Garden Hose" Structural Limitation.* Claim 10 has been amended to recite "one antimicrobial agent disposed in said polymer composition" and to further include structural limitations specific to a garden hose. The specific claimed diameter is not explicitly recited in the specification; Applicant requests that the Examiner take official notice of the fact that garden hoses routinely are found in the standard diameters of 0.5", 0.625", 0.75" and 1.0". In support of this fact, Applicant includes print-outs of various Internet pages from Popular Mechanics®, Lowe's®, and Aubuchon Hardware (a New England hardware chain). (See Weston Declaration and exhibits thereto, attached.)

Modak '640 and Milner, US 5,091,442, disclose triclosan in a tubular structure such as a catheter or condom, but fail to teach or fairly suggest triclosan in a garden hose structure. The physical structure and especially operating environment of a garden hose is markedly different from that of a medical catheter or a condom. As well, the presence of stagnant fluid within the garden hose, the period of time in which such fluids may remain present and foster microbial colonization, and the repeated use of a garden hose are significant factors not contemplated by one of skill in the catheter and condom arts.

One of ordinary skill, upon reading Milner '442, would see it as no more than obvious to try triclosan in a garden hose structure. No reasonable expectation of success in a garden hose application is taught or suggested by Modak '640 or Milner '442. Claim 10, and claims 11-12 depending therefrom, are allowable over the cited art.

*Modak '640 and Milner '442 Teach A Time-Released Antimicrobial Agent.* Yet another key difference between the present garden hose and the catheters/condoms of the prior art is term of use. Condoms are single-use items, and catheters typically also are used only once and discarded. In contrast, a garden hose is retained and periodically used for periods of months to years. Retention of antimicrobial agent(s) within the hose structure for long-term antimicrobial property is a significant consideration in garden hose uses, but it is not a factor in single-use medical and condom applications.

Modak '640 and Milner '442 both reinforce this distinction in teaching a tube that releases the antiinfective/antimicrobial agent over time. (See, e.g., Modak '640, col. 6, lines 17-58; Milner '442, col. 2, lines 34-39 and col. 2, line 67 to col. 3, line 2.)

Applicant is unsure why triclosan (2,4,4'- trichloro-2'-hydroxydiphenol ether) was observed by Milner '442 to slowly release from a latex rubber catheter, nor why a triclosan-chlorhexidine antimicrobial combination was observed by Modak '640 to release from the tubing therein described, even if such tubing is made of polyvinylchloride.

In sharp contrast, however, both Applicant's prototypes and its commercial antimicrobial garden hoses as presently claimed—in each case a polyvinylchloride hose employing triclosan—do not exhibit loss of the antimicrobial agent over time. Applicant has observed that the antimicrobial concentration and effect are measurably constant over a period of several months. (See Centola Declaration, attached.) Therefore, an inherent difference must exist between the structures of Modak '640 and Milner '442 and that of the present garden hose.

Release of the antimicrobial agent from a garden hose would disadvantageously eliminate its antimicrobial effect over time. Modak '640 and Milner '442 therefore teach away from an antimicrobial garden hose, as their teachings are opposite what would be desirable for a garden hose.

#### **New Claims 20-24 and 25-34.**

*New Claims 20-24.* New independent claim 20 is directed to a garden hose having a tube constructed of a thermoplastic polymer composition including polyvinyl chloride, sized for fluid carriage in a garden use, and one organic antimicrobial agent disposed therein.

The prior art of record does not disclose, teach or fairly suggest an antimicrobial garden hose, nor a garden hose having incorporated into its structure one antimicrobial agent. Applicant also reiterates its remarks regarding the questionable utility of Modak '640 and Milner '442 (medical tubing and latex condoms) for use in garden hose applications in particular.

Claim 20 is allowable over the cited art. Claims 21-24, dependent therefrom, likewise are allowable.

*New Claims 25-34.* New independent claim 25 is directed to a garden hose having a first tube of a thermoplastic polymer composition including polyvinyl chloride therein, the first tube being sized for fluid carriage in a garden use, and a first inorganic antimicrobial agent disposed in said thermoplastic polymer composition.

Applicant reiterates the above remarks concerning the prior art and the applicability of its teachings for garden hose structures/uses. Modak '640 and Milner '442 likewise do not disclose, teach or suggest a garden hose constructed of a thermoplastic polymer tube having incorporated therein an inorganic antimicrobial agent.

Claim 25 is allowable over the cited art. Claims 26-34, dependent therefrom, likewise are allowable.

#### CONCLUSION

The claims as currently pending are allowable over the art of record. Applicant respectfully requests that the application be advanced to allowance. If outstanding issues remain, the Examiner is urged to contact the below signed.

Respectfully submitted,



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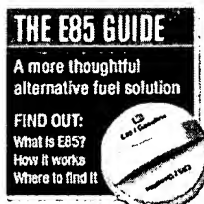
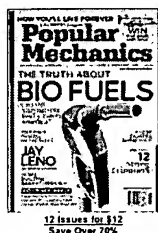
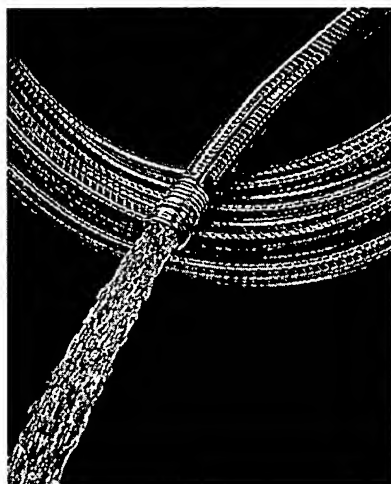
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## GARDEN HOSES

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BY THOMAS KLENCK  
Photos by Rosario Capotosto  
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The plumbing system in your home is a lot like the electrical system. In both cases, you have a fixed array of supply conduits that deliver water and electricity to where it's needed most. You only deal with the permanent terminals—electrical outlets and faucets and drains. Sometimes, though, these fixed terminals are just not enough. When it comes to powering the circular saw in the backyard, you don't think twice—you get an extension cord. When it comes to bringing water to the driveway for the Sunday car wash, you get a hose.

The similarities don't stop here. While you may think that one hose is much like the next, you might be surprised at the variations available. In the same way that you choose your extension cord to suit the requirements of a tool or fixture, your hose selection should be based on the job at hand.

Hoses are distinguished by their diameter, length and the material that they're made of. Typical garden and utility hose diameters range from 1/2 to 3/4 in. While the larger-diameter hoses move more water, a 1/2-in.-dia. model will do fine for watering the garden or spraying the kids on a hot afternoon.

As for length, you can buy a hose as short as 25 ft. or as long as 100 ft. Like the hose's diameter, its length affects the pressure at the end. There's no point in keeping 100 ft. of hose coiled on the side of your house when your garden is only 10 ft. away.

Where hoses really start to differ, though, is in their construction. For ease of handling, light weight and economy, most manufacturers offer a basic vinyl hose, usually reinforced with a radial cord. Serious gardeners, though, look for the addition of rubber in their hose. Although rubber is heavier than vinyl and somewhat harder to handle, it contributes to increased burst strength, durability and longevity. Composite reinforced rubber/vinyl hoses make sense for frequent home and light-duty commercial use, while reinforced rubber hoses handle the most demanding requirements.

Of course, the last thing you want is a hose that leaks. Or is it? Surprisingly, leaky hoses make up a significant part of the hose marketplace. They're called sprinkler hoses, or soaker hoses, and they're designed to leak—uniformly along the length of the hose at just the right rate. Vinyl sprinkler hoses are generally flat, so they can be laid on the ground with their perforated side facing up. A capped end forces the water through the perforations in a fine spray for watering lawns and narrow garden areas. Soaker hoses, on the other hand, don't spray water, but allow it to weep into the soil at a slow, continuous rate.



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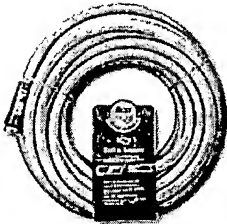
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### Choosing and Repairing Garden Hoses



A garden hose is an essential part of your outdoor toolbox. Just think...with one tool, you can wash the car, fill the birdbath, water the geraniums, and spray the kids. But before you go shopping, here are some definitions to help you untangle garden hose terminology. And, if your old water hose is still salvageable, we've also included a few tips on how to repair it.

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#### Hose Terminology

**Materials** — Vinyl and vinyl-reinforced hoses are inexpensive, lightweight and easy to handle. Rubber hoses and hoses reinforced with rubber are heavier and more durable. Because of their durability, rubber hoses have a slightly higher price tag. Reinforced hoses stand up to temperature changes better and are less likely to kink or burst.

**Ply** — A ply is a layer. More plies means more strength. Household hoses vary from one to six plies.

**Size** — The bigger the diameter, the more water will be delivered. Hoses of 1/2", 5/8", 3/4" and 1" are available. The most common sizes are 3/4" and 5/8".

**Length** — Hose is sold in increments of 25 feet, usually 25 to 100 feet in total length. Water pressure diminishes as the hose length increases, so buy a hose that's long enough to reach where you'll be using it and no longer. If you occasionally require a long hose, buy two shorter ones and combine when needed. If you have two spigots, put one hose at each water supply.

**Coupling** (or fitting) — The coupling is where the hose attaches to the water supply. Your two main choices are brass and plastic. Brass is more durable than plastic but may be difficult for anyone with limited hand strength to tighten to the spigot. For easy hand tightening, choose a hose with an ergonomically shaped plastic coupling.

**Type** — In addition to the common type hose, there are other specialty types available.

- **Sprinkler** and **soaker** hoses are made especially for lawn and garden irrigation. Sprinkler hoses are designed for use on the ground surface and also dotted with holes on one side to gently spray upwards. A soaker hose is porous and can be buried under a layer of mulch. The hose leaks small amounts of water directly to your garden's or flowerbed's roots with little waste.
- If you grab an occasional drink from your hose on a hot day, get a hose that's designated **boat**, **marine**, or **recreational**. Their plastic lining makes them safe for transmitting drinking water. The components used in standard hoses are not always safe for ingestion.
- A space-saving **flat hose** expands to its full diameter when the water is turned on and stores flat when not in use.
- **Commercial** hoses are designed for hot water and heavy-duty continuous use.

A quality hose with the proper nozzle is a good investment. Buy a good one, take care of it and it will last a long time. To prolong the life of your hose:

- Keep it out of the sun. Hot water expands in the hose; UV rays weaken the material.
- Coil after use, either by hand or with a hose reel. If the hose kinks, re-roll it immediately to prevent splitting.
- During winter, drain the hose and store it out of the elements.

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## Repairing a Hose

It's usually not too difficult to spot a leak in a garden hose. They always seem to be located in just the right spot to spray you in the face, but don't get mad and throw away the hose. A simple, inexpensive repair may be all that's needed to put it back in working order.

### Tiny hole or small crack:

Specially designed hose repair **tape** is available, or use common electrical tape in a pinch. Clean and dry the hose before applying. Overlap the tape as you wrap it around the hose. Don't wrap it too tightly or the hose will crease and the tape won't seal.

### Leaking at spigot:

A **washer** replacement is the simplest of all repairs and is often all that's needed. Washers dry or deteriorate with age. Simply remove the old one and pop in a new one. If it still leaks, replace the coupling.

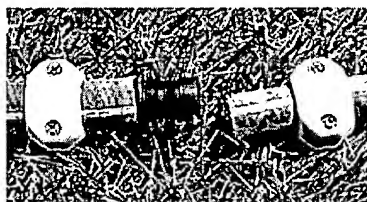
### Large leaks:

Replacing a hose end or repairing a center section are a little more involved, but still a simple job. The repair requires cutting the damaged section out, and replacing with a new part that clamps or crimps on.

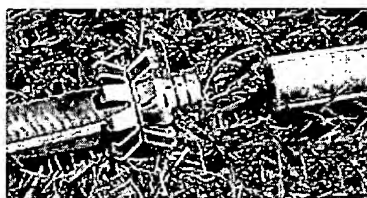
When cutting away damaged parts, make straight cuts with a sharp blade. To be certain you get the proper repair part take the removed portion with you when purchasing the replacement. Repair part designs differ by manufacturer. Having the old piece with you helps you make sure you get the right diameter and helps you choose correctly between **male** or **female** repair parts. Also make sure that the part you select is the correct one for your hose material, whether rubber or vinyl.

#### To make replacing fittings easier:

- Make sure the hose is clean and dry.
- Rub a little soap on the area you're repairing to make it more pliable and easier to work with.



A Clamp-Style Fitting



A Crimp-Style Fitting

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Garden hose is a staple item. The gallons of water a hose will carry is determined by three factors-size, length and available water pressure. Most manufacturers have charts giving this information. The inside diameter of the hose determines its efficiency.

Low-priced, promotional hoses, usually 1/2" diameter, deliver 9 gal. per minute (gpm), and higher quality hoses with 5/8" diameter deliver 17 gpm. A 3/4" hose delivers 23 gpm, almost three times what a 1/2" hose delivers. The larger the inside diameter of the hose, the less pressure loss over any distance. If the pressure is low (under 40 psi), the hose is running uphill, or is extra long, then the largest size hose available should be used to minimize pressure loss in the hose line.

To prevent premature cracking, hose should never be kinked or bent sharply either in use or in storage. Hose should be stored in season by coiling it on a wide bracket, hose hanger or reel, never by hanging it on a sharp nail or hook.

Before winter, drain all water from the hose, and then store it inside in coils. Use a small brush to clean out fittings threads prior to winter storage.

Never tug on hose when trying to eliminate a kink. This can cause the kink to permanently set in. Kinks should always be worked out by hand. Inexpensive hoses have a greater tendency to kink due to their thin walls, and frequently sprout leaks at those kink points.

### Rubber Garden Hose

Rubber hose reinforced with tire cord fiber, generally nylon or polyester, and other additives has good resistance to weathering, cracking and ozone deterioration. A top quality hose can be shut off at the nozzle without bursting. Promotional lines have less reinforcement material.

Couplings should be full-flow, meaning internally expanded to maintain inside diameter for better water flow.

Most reinforced rubber hose can be used with hot water.

### Rubber-Vinyl Garden Hose

Although all rubber-vinyl hose is reinforced with tire cord fiber, there are two basic kinds in use.

One uses an expanded (or foamed) cover containing tiny air cells, similar to a fine sponge, giving it a softer feel, easier handling and more kink resistance.

The other has an extruded (non-foam) cover; it offers good flexibility but not as much as the expanded cover type. However, it is just as durable and has more dirt and abrasion resistance.

### Vinyl Garden Hose

"Reinforced vinyl" is the preferred generic name for vinyl hose, although a great deal of non-reinforced vinyl hose is sold.

The variables in vinyl hose include cover type (clear or opaque), reinforcement (knit or belted), foamed or non-foamed layers, wall thickness, burst-pressure rating and couplings.

Reinforcement is the primary factor in vinyl hose quality. Other factors, such as the tube compound material used in manufacturing, also affect the quality of the hose.

Burst-pressure rating depends most on reinforcement. Best quality hoses have two layers of belted bias radial or spiral and knit reinforcement.

Burst pressure should be at least four times the average faucet pressure to allow for surge pressures, use with pistol nozzles, etc. Burst strength depends upon the combination of reinforcement and the tube wall gauge. Lower-quality hoses typically have a burst rating of 200 psi, medium quality 275-350 psi, and high quality 350-500 psi.

Couplings should be internally expanded type to allow full inside diameter to be used; externally crimped couplings tend to restrict water flow.

"Wing connector nuts" make attaching hose to faucet very easy.

Non-reinforced vinyl hose is adequate for "open service" only and is suitable for use with rotary or oscillating sprinklers. Because of its low burst pressure, nozzles, pulsating sprinklers or any accessories with integral shut-off valves are not recommended.

### **Flat Garden Hose**

Flat Hose lies flat until water pressure rounds it into 5/8" hose. A prime feature is that flat hose stores more easily and more compactly than conventional hose.

Flat hose must be completely extended before water will pass through it and it must be completely drained before storing.

There are two types of flat hose. One is made of a polyurethane liner and a tightly woven polyester jacket. The higher quality product has the liner bonded to the jacket to reduce kinking and leaking.

The other type is similar to conventional, reinforced vinyl hose, yet is flat when empty and expands when water is added. It is not as small as the first type but has excellent wear resistance and is half the size of conventional hose.

Once rounded, flat hose performs exactly like ordinary hose, delivering the same amount of water as a regular 5/8" hose. Weight is about one-third that of conventional hose; but because it is self-draining (provided the nozzle or sprinkler end is left open), it retains less water than ordinary hose (which may hold as much as 6 lbs. of water in each 50' length).

It requires 20 psi to round out (home water pressure is 40-60 psi) and is able to withstand normal treatment. Because it drains itself, it is less susceptible to freezing and cracking.

Flat hose will return to flat shape after repeated uses, will not wear on edges, will not crack around fittings and has comparable burst strength to conventional hose.

Some flat hose is packed in a cassette that holds the hose, allows it to be pulled out for use and retracts for storage. The cassette can be hooked to the water source for use and hung in garage or basement for storage. A hose cassette is ordinarily used only for handling and storage. If the hose remains in the cassette during use, the pressure of the expanding hose could damage it.





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